

NEOTEK SERIES II

Introduction

The choice of master recording console is one of the most important that a studio owner must make. The console is the electronic heart of the studio and is the one piece of equipment that most critically affects the basic technical quality of the final products. Complicating this choice is the fact that manufacturer's claims and specifications are an unreliable basis for making comparisons. Without direct experience with each alternative it may be difficult to judge the relative merits of one desk versus another.

Systems

The Series II is designed for use as the master recording console of a multitrack studio. Each input module strip also contains a channel of monitoring capability; this approach is termed in-line monitoring. Switching within each module reorganizes the various functions so that signal flow becomes suited for recording/overdubbing or for the mixdown of multitrack master tapes. Thoughtfully designed switching not only eliminates redundant controls but will offer a great deal of easily accessed flexibility. An engineer new to in-line consoles need only keep in mind that, when recording, the monitor, meter, and cue/echo functions refer not to each microphone channel but to the tape track of the corresponding number. The NEOTEK Series II provides unusually flexible signal routing alternatives in addition to the necessary basics. As this booklet suggests, the net consequence of these subtleties is a substantial difference in professional performance between this console and others which may appear comparable. This difference results in smoother console operation and frees the engineer to concentrate on the music with the confidence that he can give the producer or the talent whatever they request.

There are other essential professional features exclusively available on the Series II: light column meters for every tape track each with peak and VU modes, monitor mute switches, equalized cue/echo masters, overload proof combining amps, and stereo solo capability. Even points as seemingly minor as calibrations on every control, making it easier to return to previous settings, show the concern for the functional aspects of recording which has gone into the design of the Series II.

When the highly refined systems engineering of the Series II is combined with NEOTEK sonic performance, the result is an unbeatable value in a moderately priced multitrack console.

Circuits

Whereas the NEOTEK Series III sets the standard for sound quality by which other multitrack consoles are to be judged, the Series II makes no concessions of sonic performance. It uses the same components and the same circuit designs including mic preamp and parametric equalizer which distinguish the Series III. What has been eliminated are convenience features such as digital logic controlled status switching; the standard of quality set by all NEOTEK consoles large or small, is uncompromised.

NEOTEK's designers have continued the painstaking refinements which have kept our consoles at the leading edge of audio circuit design, where science becomes an art. The transformerless instrumentation amp mic preamplifier is but one example of NEOTEK innovation which has become widely accepted. Similarly, NEOTEK consoles were the first to offer state-variable equalizers. Because NEOTEK circuit stages always have power bandwidths in excess of small-signal bandwidth, transient and slew-induced distortions are totally eliminated. Gain structure and impedance optimization, frequency compensation techniques, and other proprietary designs put NEOTEK circuit performance orders of magnitude ahead of competitors.

The unique grounding techniques used in NEOTEK consoles maintain the quality and integrity of the entire audio signal system. Although NEOTEKs are known for unusually wide frequency response, their stability is so absolute that they do not suffer radio frequency interference problems. They have operated flawlessly in fields well in excess of 1 volt/meter – even while ungrounded. The consequence of all of this is that NEOTEK owners can be assured that the audio quality of their console will exceed that of any other piece of equipment, analog or digital, to which it is connected.

Sonic performance

For over eight years NEOTEK has designed and manufactured only completely transformerless consoles. Our transformerless mic preamp, for example, had been highly developed in our custom multitrack consoles more than five years before other manufacturers began offering them as options. Ironically, the very designers who once publicly condemned transformerless circuits are now touting "proprietary" inputs or outputs in their own equipment. In many cases the consensus is that these new designs are sonically inferior to the older models.

Transformerless design is not itself a panacea which guarantees audible improvement. Such progress demands years of the kind of sonic refinement for which NEOTEK has become known. One result of this development has been the selection of NEOTEK consoles for the most critical audiophile recordings; designers and users of today's most advanced digital recording system found NEOTEK consoles superior to all others without regard to price and the only consoles which, when measured from inputs to outputs, offered better noise, distortion, and bandwidth than the digital recording system itself.

Similarly, well-known artists have selected NEOTEK consoles for their personal studios. Professionals who are familiar with a wide variety of equipment are in the best position to make critical evaluations. In recent months NEOTEK consoles have been chosen for the personal studios of Chet Atkins and members of Fleetwood Mac, Supertramp, and the Doobie Brothers. Their selections are the more significant because of the painstaking evaluations that were performed: pointed conversations with current owners, performance measurements by top technicians, critical listening tests including running album sessions on NEOTEK consoles.

These evaluations concerned not only the sonic quality of the consoles, but their construction and operational features as well – such users won't tolerate ill-conceived functions that fight creativity.

While we think there are many good reasons for choosing NEOTEK consoles, one fact above all has been conclusively established: when it comes to sound, nothing compares to the quality of a NEOTEK.

Prospective purchasers owe it to themselves to carefully study each console's operational features in hypothetical situations, to consult previous owners, and to critically audition recorded material. A console's basic price is seldom an index of its value. NEOTEK owners have repeatedly shown that a console which sounds great, makes staff and freelance engineers look like heroes, and quickly gives producers and artists what they want is a far wiser choice than a console whose main attraction was an initial low price. The purchase of a recording console is also the initiation of an interdependent relationship with the console manufacturer and its dealer and quality is as important in this regard as with the console itself. From every standpoint NEOTEK consoles offer outstanding value; we invite, and challenge, the most critical comparisons.

INPUT / OUTPUT MODULE

The Input module is the heart of the Series II console; it supports the functions and features which make the entire system reliable and effective. These modules plug into a motherboard structure mounted on rigid custom extrusions. A special self-aligning metal-to-metal connector system is used which was specifically developed for audio signals because card-edge and computer type connectors have proven inappropriate.

A dual control continuously adjusts the MIC and LINE preamp **GAINS**. Design of the console insures that these functions never conflict and the accessibility of the line gain allows easy compensation for a track cut too low for convenient mixing or too hot to add desired EQ.

The mic preamp is the latest version of the completely transformerless instrumentation amp that NEOTEK introduced to the industry over eight years ago. It is the same preamp employed in NEOTEK consoles used to record Grammy-winning audiophile albums - no similar console can make this claim because none other offers this level of sonic quality. The preamp will accept +12dBu (over 3 volts) without any decrease of performance so no pad is required or desirable. Pads degrade noise performance and invariably color the sound of quality microphones.

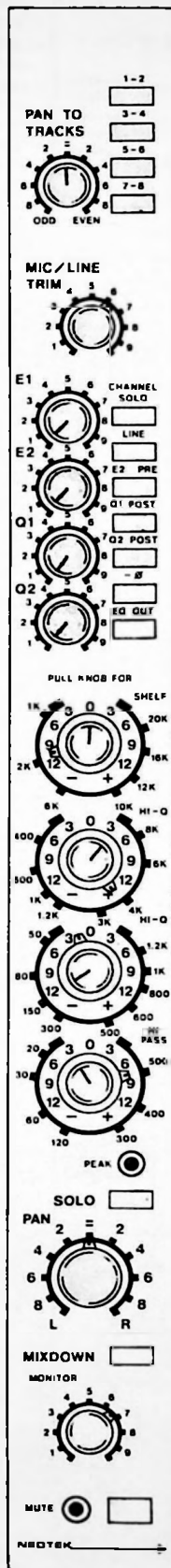
The high input impedance of the mic preamp in addition to eliciting the optimum sound from low impedance microphones, also allows many instruments to be recorded straight in, without a direct box.

The four-band multi-mode state variable **EQUALIZER** used in the Series II is incredibly powerful yet offers the musicality for which NEOTEK equalizers have become known. The bands have no excess phase shift or ringing and are completely non-interacting, more importantly, they sound great.

In the normal mode (all boost/cut knobs - the upper knobs - pushed in) all bands are peak/dip filters with just over one octave bandwidth. Their curves are exactly reciprocal and symmetrical and do not distort when swept or even when crossed over each other. When the high band boost/cut knob is pulled upward, that band's mode switches to a smooth shelving response with the characteristic frequency and gain unaffected. The two mid bands similarly switch to high-Q (narrow) modes without changing frequency or degree of boost or cut. They are then useful for special effects such as removing sibilance or resonances, adding bite to an instrument, or even as a one-pass phaser. The low band, when its boost/cut control is pulled outward, changes into a tunable high-pass filter with smooth 12dB Butterworth response, allowing the engineer instant comparison of cut versus roll-off characteristics. All in all the equalizer section of the Series II is one of the most versatile of any multitrack console.

The **MUTE** switch is the most accessible button on the I/O module. It silently removes all pre-fader sends from their mixes and so indicates with an LED. Since engineers commonly use Mutes as manual in-place solos, pre-fader sends (headphone mixes) are unaffected. Because the Mute operates on the output of the Pan control, whether the source is the Monitor pot when recording or the fader when mixing, it is much more useful than if it affected the fader alone. Not so obviously, because the Mute actually removes the channel from the 2-mix, the effective noise gain of the stereo combining amps is actually lowered, this feature alone can mean 15dB or more improvement in noise performance over other console designs. To make the Mutes more effective while recording, they affect only the Monitor signal; the tracks are properly muted by releasing track assignments or taking the tape machine channel out of record mode.

Each Input/Output module is fitted with a quality 105mm (4-inch) semi-sealed conductive plastic **FADER**. Alternatively, modules may be fitted or field retrofitted with P&G faders, VCA subgrouping faders, or today's most popular automation system: the Valley People Fader.



Assignment of each input module to any of the eight mixing buses is made through the **PAN-TO-TRACKS** control. This is a true dual-section pot with sine/cosine characteristic. Each of the eight mixing buses feeds up to three multitrack tape recorder channels through the patch bay. No direct output or patching is required for this function, but the direct output which each input module sends to the bay is at full line level and so is capable of driving the multitrack when it is necessary to record more than eight channels at once - a live concert recording, for example.

Because of the design of the Series II, these buses may also be used for stereo or mono sub-mixes or as additional stereo or mono echo send buses. The ability to create submixes is especially useful during mixdown sessions.

The **CHANNEL SOLO** is a pre-fader mono solo of the input signal taken just before assignment to the mixing buses. When actuated, both the **SOLO** and **MONO** lights in the Monitor Module will illuminate and the soloed source or sources will appear in isolation in the monitor mix (only).

The **CUE/ECHO** BUS system of the Series II is unusually flexible, as a study of the block diagram will suggest. The controls don't simply switch pre or post, but are configurable to solve the kind of common problems which can otherwise sidetrack creative efforts in the studio: a musician doing overdubs wants to hear his live mic and his old track simultaneously; a producer wants pre- and post-fader echo sends onto the same bus, sometimes from the same input, post-fader individual echo send is desired in a drum submix during mixdown. These and other setups are nearly impossible on many consoles but are easily accomplished on the Series II. Normal operation is even simpler: the engineer need not push any switches to set up the standard auxiliary sends.

The **PHASE** switch (Φ) inverts the polarity of the input signal whether it is the mic or line. Thus it is useful in mixdown (whether you recorded the track or not) as well as when cutting tracks.

The **EQ OUT** button noiselessly removes the equalizer section from the signal path. Note that the equalizer is split by the patch point. This allows low end control, such as removal of bass leakage or foot stomps, before processing by a compressor, yet retains high end control at the more desirable post-insertion location.

PAN SOLO solos the output of the Pan pot in the monitoring mix in stereo. This stereo solo function is rare on multitrack consoles in any price category, but without it the engineer cannot determine the placement of sources being recorded as a stereo group (stereo drums; stereo piano; stereo strings, horns, or chorus). The Series II offers Channel Solo of each mic in a mix, and stereo Pan Solo of the complete mix. In mixdown too, the stereo solo function is the only way to achieve realistic evaluation of spatial placement in the complete mix. Pan Solo is independent of the Mute switch.

The I/O module's main **PAN** control feeds the 2-mix (stereo) bus. While recording or overdubbing tracks it is driven from the Monitor pot and when the Mixdown switch is pushed it is driven, along with the echo sends, from the main fader.

The **MIXDOWN** switch causes the 2-mix and Cue/Echo buses to be sourced from the main input channel, and therefore to respond to the equalizer and fader, instead of relating to the Monitor function.

The **MONITOR** control adjusts the monitoring level of the signal which is being recorded or played back by the multitrack tape machine. Due to the logical interface of the console with the tape machines, this signal and the cues and echo sends follow punch-ins, sync playback, and direct feeds while recording basic tracks and/or overdubs.

Between the I/O module and the fader module is a massive structural extrusion into which is set a malamine laminate write-on-strip. Channel numbers are engraved into this strip and it conveniently retains one-inch leader tape on which track assignments may be written and left stored with the master tape.

The CUE/ECHO module contains the combining amps and equalizers for the auxiliary (nominally cue and echo) buses. The level controls are actually gain controls on the combiners, so these bus masters can never be overloaded by any combination of input signals and yet will always produce optimum noise and headroom performance.

Each master also features a simple but effective equalizer. This feature makes a big difference in the ease with which a satisfactory headphone mix can be obtained or when it becomes desirable to quickly take some boom out of a chamber send.

Each auxiliary bus master section has a solo switch that functions in stereo; add on the left, even on the right. This is the only way that stereo headphone or stereo echo mixes can properly be evaluated and yet it is unique to NEOTEK consoles.

CONSTRUCTION

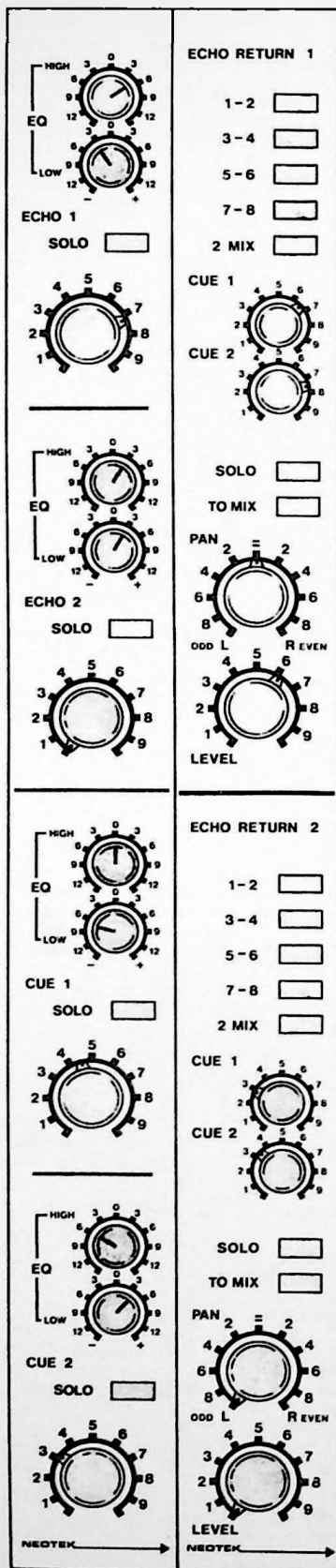
Front panels of Series II modules are eighth-inch aircraft aluminum and the frame is made of rigid custom extrusions. Standard cabinetry is solid oak but our in-house shop works in walnut, teak, ash and other hardwoods. Welded steel legs are available or the console may be built into custom construction. I/O connections are high-reliability professional punch blocks so that installation proceeds quickly without soldering, pin crimping, or any additional connectors.

METERS

Each channel of the multitrack tape machine is monitored by a multisegment light-column METER aligned immediately above the correspondingly numbered input channel in a meter bridge with blackout face panel. These 1/2 or 24 meters can be switched between peak or VU response individually or from master pushbuttons. In peak mode their sensitivity is reduced 10dB so that the display remains properly on scale.

PATCH BAY

PATCH BAYS on the Series II employ metal frame jacks mounted in solid frames which we mill from 3/8" thick aluminum bar. We use no p.c. mounted plastic jacks and all connections are hand-soldered shielded cable rather than unshielded computer cable on pin connectors. This more costly approach reflects the professionalism designed into NEOTEK consoles and our concern for uncompromised sonic integrity at every point. Each row is removeable on a service loop for cleaning or custom re-wiring.



Series II consoles are normally fitted with two stereo ECHO RETURN channels, but additional returns are a simple plug-in option. These channels may be routed to the multitrack buses when wet tracks are desired or when the track buses are being used for special functions during mix-down. They may also be routed only to the 2-mix for monitoring wet while recording dry tracks. The returns solo in STEREO, an essential feature on a professional console.

Since the echo returns each send to the cue buses, a more flexible system results than if the returns were simply two pots on the cue masters.

The 2-MIX module contains the main stereo combining amp which, like the track combiners, offers nearly 30dB more dynamic range than today's best digital recorders. That's one reason why NEOTEK consoles are chosen for use with the finest of these systems. The trims mean an engineer can precisely trim the stereo center or the entire mix level without having to make adjustments of each input fader.

The PRE-ECHO MUTE silently removes all input from the 2-mix buses with the exception of the echo returns while simultaneously grounding the main echo chamber inputs. This will cause the mix to go completely silent and the echo to ring out. NEOTEK consoles are the only ones whose sophisticated combiner design permits this simple but useful feature.

Also on this module are a jack for the talkback mic, allowing a gooseneck if desired, and a switch to kill the phantom power to all the mic inputs. A special ultra-low-noise phantom power supply capable of supplying over 80mA (enough for 200 Neumann mics) is a standard feature.

Remember that a professional multitrack console may find auxiliary sends and returns used for a variety of purposes by creative engineers working sophisticated sessions and there is nothing more frustrating than running up against the limitations of compromises in console designs. The Series II was designed by and for creative engineers.

PHANTOM POWER



LEFT



RIGHT



PRE-ECHO MUTE

The **METER SELECT** switches allow the 2-mix meters to be routed to meter other outputs or inputs of the console. Normally the **EXTRA** position follows the Control Room input select switches.

Series II consoles have two **SOLO** systems: a mono solo of each input channel signal and a stereo solo of the channel's output to the 2-mix buses whether that represents a monitoring or mixdown function. Internal logic causes the control room signal to become mono and an LED to so indicate when a mono function is soloed. The mono function may also be used to bring a stereo solo into true mono for comparisons. An LED indicates that either solo function is operating.

Although uncommon even on costly multi-track consoles, stereo solo is essential for professional results. It is the only effective way to evaluate placement in stereo drum tracks, stereo strings or horns, even stereo headphone mixes.

The **SOLO LOCKOUT** function allows several inputs to, in effect, be taken in and out of solo with a single button, like the group solo function available with automated consoles.

The **OSCILLATOR** of the Series II offers six accurately leveled frequencies for slating, machine alignment, or mastering line-up. The **SLATE** switch applies a tone, usually 30 Hz, and the talkback mic to the heads of takes while simultaneously sending the mic (only) to the headphones and studio speakers. Only a single switch is necessary for this function. Separate level control allows optimizing all the various balances and functions for which the oscillator is used. In addition, the direct output of the oscillator also appears in the patch bay for convenience when testing other studio gear.

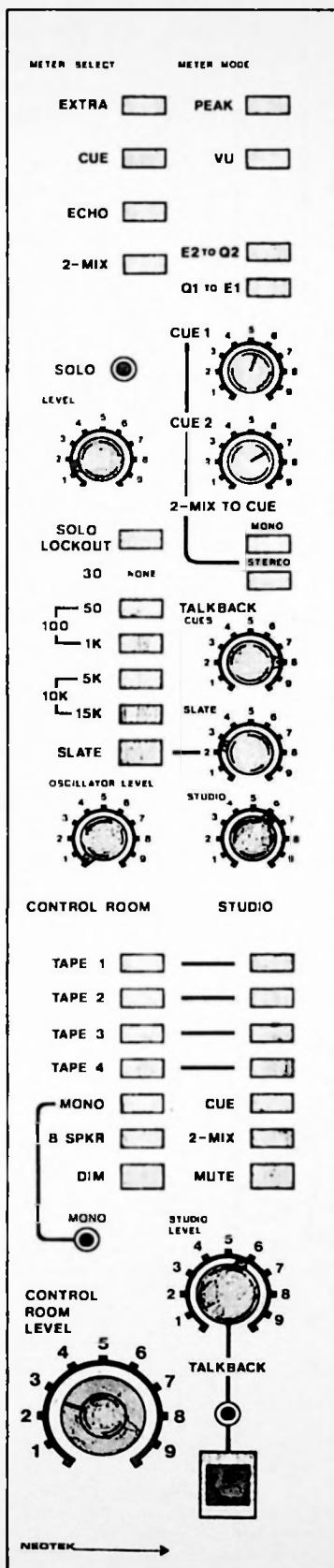
Four **STEREO TAPE INPUTS** may be selected for the control room monitor signal in place of the 2-mix. The four tape machines are provided with full I/O points in the patch bay to enable direct transfer from deck to deck, tape echo, etc.

The **MONO** switch silently combines the left and right monitoring signals without effect on the stereo 2-mix.

Convenient comparison of the monitored signals on small speakers is made possible by the **B SPKR** switch.

The logic-controlled **DIM** switch drops, but does not mute, the monitoring level to allow discussion or phone answering in the control room without interrupting the program.

One of the most important criteria for monitoring functions is that the monitor signal exactly reflect the 2-mix. The Series II **CONTROL ROOM LEVEL** pot is a specially selected ultra-precision stepped attenuator which has better than 1/2dB left-right tracking. Since all signals invariably pass through a console's control room level pot, without such precision a studio may not realize that its product has a center imbalance which may even be monitor level dependent. This is another point at which any compromise is unacceptable.



Each of the 26 light column meters for the multi-track buses may be individually switched to peak or VU response, by means of a touch-sensitive switch located on the meter itself. In addition, the two **METER MODE** switches cause all the meters to switch at once.

The **E2 to Q2** and **Q1 to E1** switches add exceptional flexibility to the auxiliary bus system of the Series II; what they accomplish is the assignment of an entire auxiliary bus as a subgroup of another bus master. With Echo bus 2 as a subgroup of Cue bus 2, input modules may be switched so that their Echo 2 send is pre-fader, i.e., from an individual microphone. Since Cue 2 on all channels is also taken from the line input, Cue 2 bus overall can now have sends from old tracks (pre-monitor) and new tracks (pre-fader) simultaneously. Accomplishing this is truly easier than explaining it, but it is a feature often requested by artists when laying down overdubs. In a similar manner Q1 to E1 can be used to develop pre-fader as well as post-fader echo sends on Echo 1 during mixdown. This can enhance horn, string, and choral tracks, but it is difficult to achieve on less sophisticated consoles.

The **2-MIX TO CUE** function is another operational convenience which engineers appreciate and which helps generate repeat customers. Often, in adding a few quick overdubs it is tedious and unnecessary to generate a cue mix in addition to monitor and echo mixes. With the Series II the 2-mix, which is the monitoring mix except that it is unaffected by solo functions, may be sent directly to the cue masters in either stereo or mono. Should the artist want to hear his track louder in the cue mix than the engineer and producer want it in their monitoring mix, individual cue sends may also be dialed in as desired.

Since the optimum level for the **TALKBACK** mic in the cue system, slate, and studio playback speakers is never the same, the Series II provides three separate level controls.

STUDIO INPUT SWITCHES select four stereo tape sources, stereo cues, or the 2-mix independently of the **CONTROL ROOM** source. Session artists in the studio may hear a cassette while the engineer and producer review the previous takes, and so forth.

The **MUTE** prevents any leakage into the studio and prevents the need for readjustment of the **STUDIO LEVEL** pot at every playback. The Studio Level pot of course determines the playback, but the studio talkback level is independent of its setting.

The **TRACK MASTER** module contains the mixing bus combining amps. In the patch bay, each of the eight combining amps is routed to three (two on 16-track consoles) recorder inputs through normalized jacks. Controls on the tape machine (Record Ready) determine which tracks will accept their signals and which will simply ignore them. These mixing buses may be used as sub-masters or extra echo buses (both either mono or stereo) during mixdown. The unique NEOTEK design means it is possible to drive a single bus with a large number of full-level inputs without danger of overload or the need to go back and trim each fader in the mix to prevent it. This is just one more detail that makes sessions go smoother on NEOTEK consoles.

The **TALKBACK** button turns on the talkback mic and dims the control room speakers, allowing 2-way conversations with artists in the studio as long as it is held down. Since it is a logic-controlled function, additional remote switches may be added and require only a simple contact closure to ground.

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2-10-18



3-11-19



4-12-20



5-13-21



6-14-22

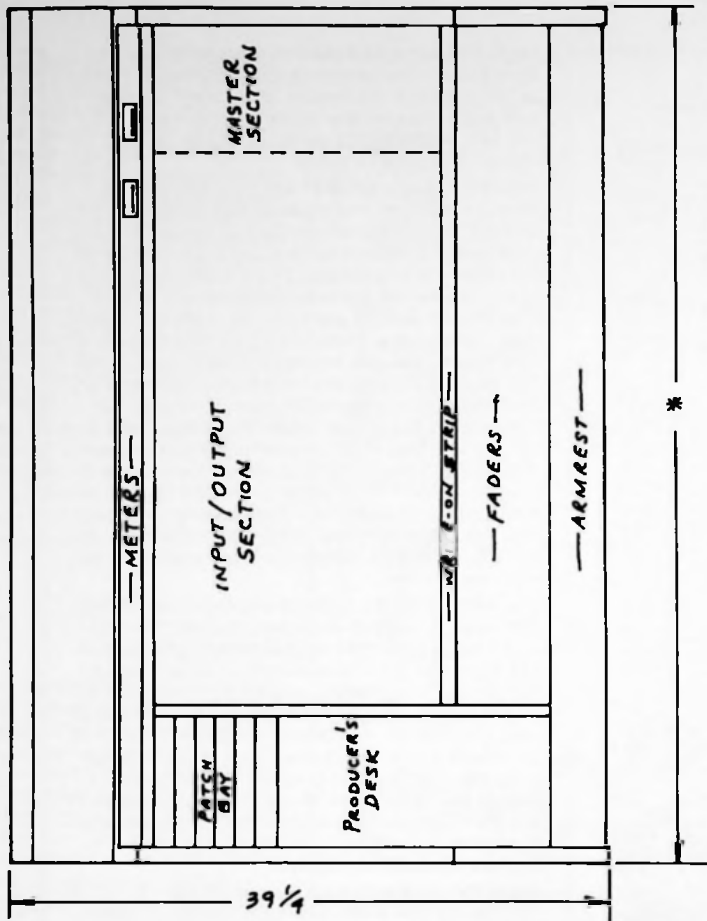


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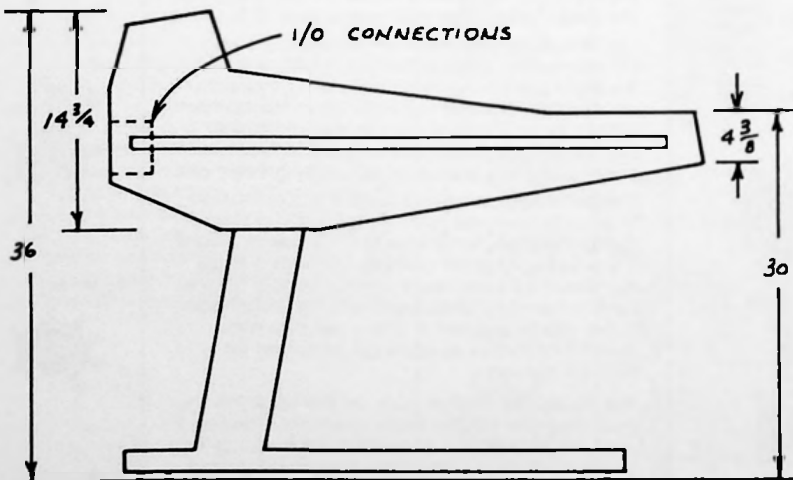
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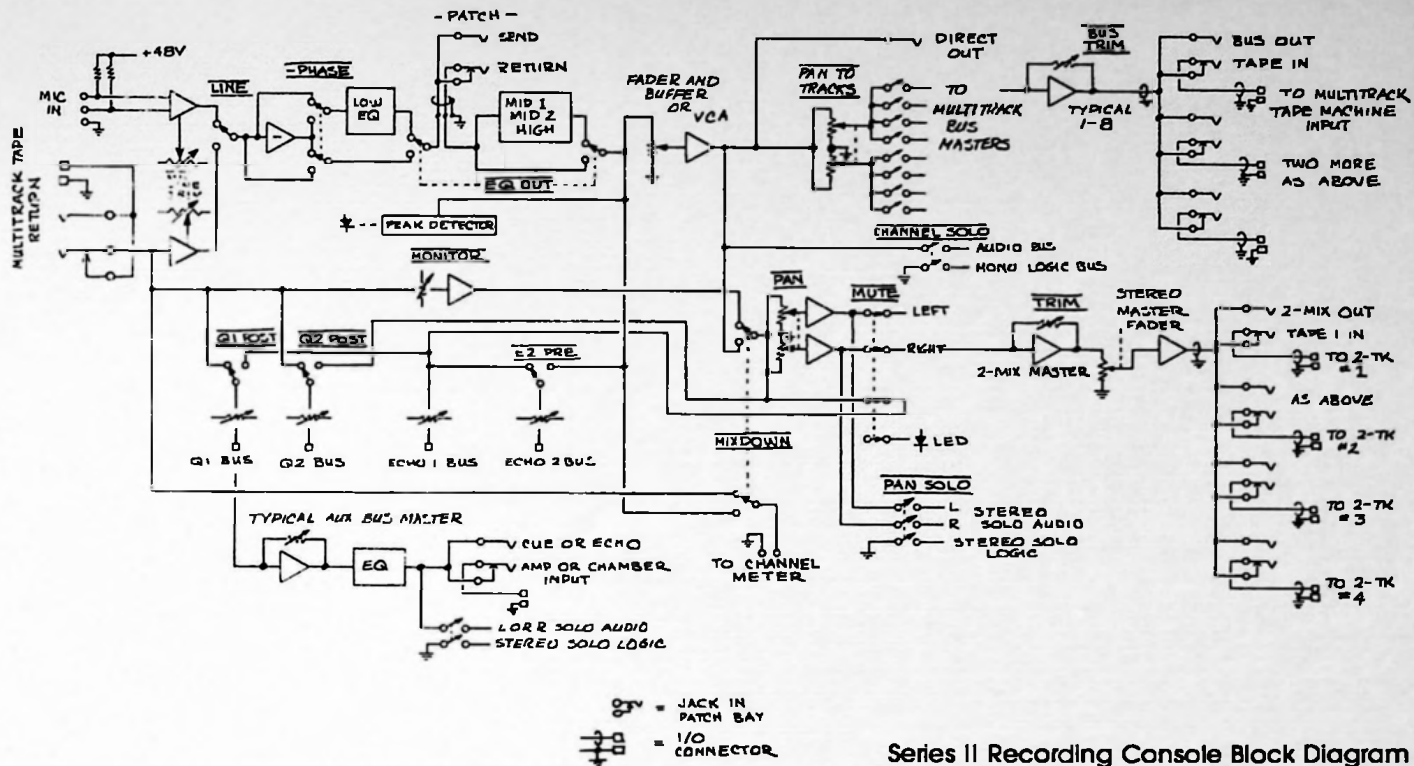




Series II Recording Console Dimensions

Format	Width
20 input, 16 output	65"
24 input, 16 output	72"
28 input, 16 output	79 $\frac{3}{4}$ "
28 input, 24 output	79 $\frac{3}{4}$ "
32 input, 24 output	86 $\frac{3}{4}$ "
36 input, 24 output	97 $\frac{5}{8}$ "
Tolerance	$\frac{1}{8}$ "





Series II Recording Console Block Diagram

Specifications

Manufacturers' claims and specifications are the least reliable basis on which to evaluate console performance; they are highly subject to enhancement. NEOTEK has long contended that excellent performance specifications are the consequence, not the goal, of superlative design. Our consoles have produced gold albums, Grammy-winning albums, and audiophile albums both digital and analog of the highest caliber; they are used whenever engineers demand maximum quality. It is also true, however, that when measured from input to output and compared to all other consoles, in every case NEOTEKs are demonstrably superior in terms of noise, distortion, and dynamic range. More importantly, after years of intensive listening comparisons by the most critical engineers one fact has been firmly established: when it comes to sonic quality, nothing at any price beats a NEOTEK.

NEOTEKCORPORATION

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Series II Recording Console		List Price
Format	20 input, 16 output	18,100.00
	24 input, 16 output	20,650.00
	28 input, 16 output	22,750.00
	28 input, 24 output	23,500.00
	32 input, 24 output	25,975.00
	36 input, 24 output	28,075.00
Options	VCA module, substituted for standard fader module	190.00
	VCA submaster module	225.00
	Penny and Giles series 3000 mono fader, substituted for standard fader	55.00
	Additional 56 point patch bay, wired for additional balanced lines	450.00
	Additional 72 point patch bay, wired for additional balanced lines	575.00
	Mechanical VU meters on the 2-mix output	300.00
	Tape machine remote	175.00
	Additional talkback switch on left side of console	45.00
	Multiple pin input/output connectors	Quotation
Integral producer's desk	Quotation	
Leg set	740.00	
Expansion Modules	Input group, including fader module	475.00
	Echo return pair, add one additional module only	290.00
	VCA module	240.00
	VCA submaster module	225.00
Accessories and Spares	Input module	425.00
	Power Supply	850.00
	Mono fader, standard	28.00
	Mono fader, Penny and Giles series 3000	85.00
	Stereo fader, Penny and Giles series 3000	130.00
	Extender card	50.00
	Patch cords, specify length, 12 inch or 24 inch	14.00
	Flight case, for any standard format and power supply	950.00

Notes

1. Consoles may be ordered partially filled. Deduct each input group not required.
2. Price of console includes; power supply, bargraph meters, patch bay, Penny and Giles series 3000 Stereo Master fader, punch block input/output connectors, punch block insertion tool, and solid oak frame.
3. Exotic hardwoods are available, contact the factory for pricing and delivery.
4. Larger formats are available, contact the factory for pricing and delivery.
5. Crating and freight are additional.
6. Prices are effective January 1, 1983, given in United States dollars, and are subject to change without notice.